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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
KILPATRICK, BRYAN T	

ART UNIT	PAPER NUMBER
1797	

NOTIFICATION DATE	DELIVERY MODE
06/19/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/581,458	ADLER ET AL.	
	Examiner	Art Unit	
	BRYAN T. KILPATRICK	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

The disclosure is objected to because of the following informalities: the Abstract discloses the open end of at least one reaction tube is cited as being "2e" and "2c." Appropriate correction is required.

Claim Objections

Claim 18 is objected to because of the following informalities: the collection cone is cited as being "5," the same citation for the reactor cooling means. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 14 recites the limitation "A process for the thermal decomposition..." in the first line. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "... the substrate" in the last line. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 2,488,406 (Hirsch), and further in view of U.S. Patent 3,012,861 (Ling).

In regards to instant claim 1, Hirsch discloses a reactor apparatus (Figure 1 and col. 3, lines 55-75) having a pressure vessel (shell 10) with a conical bottom 11, a catalyst reactivator 19 and standpipe 18 (similar to a reaction tube), gas feed 20, and a cooling tubes 12 that are mounted in the walls of the device.

Hirsch does not disclose a heat source, or a gas outlet unit having a gas inlet/guiding region, filtering system, and gas outlet. However, Ling discloses a silicon reactor apparatus (Figure 1 and col. 2, lines 1-19) having a heating means 11, a conical bottom 3 connected to a valve outlet 14, and an outlet unit comprised of outlet 9, cyclone 13, condensing system 10 for removing by-product gases. Hirsch and Ling are analogous art in that they both disclose the use of an apparatus having reactor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the components of the Ling reactor apparatus to modify the Hirsch

reactor apparatus for the purpose of disclosing a method of thermally decomposing volatile silicon compounds as disclosed in col. 1, lines 9-12 of Ling.

In regards to instant claim 2, Hirsch discloses cooling tubes 12 that are mounted in the walls of the device (col. 3, line 60). Ling discloses a cooling component in col. 4, lines 30-32.

In regards to instant claim 3, Hirsch discloses that the catalyst reactivator 19 and standpipe 18 are 2.0 ft and 16 ft tall, respectively (col. 8, lines 16-22).

In regards to instant claim 4, Hirsch discloses that the catalyst reactivator 19 and standpipe 18 have diameters of 5.0 ft and 2.5 ft, respectively (col. 8, lines 16-22).

In regards to instant claim 5, Ling discloses a quartz reactor (col. 2, line 57) and using nickel for a reactor 9 (col. 6, line 24).

In regards to instant claim 6, Ling discloses a heating means surrounding a reactor (col. 2, lines 15-16).

In regards to instant claim 7, Hirsch discloses cooling tubes 12 that are mounted in the walls of the device (col. 3, line 60). Ling discloses a cooling component in col. 4, lines 30-32.

In regards to instant claim 8, Ling discloses a heating source the length of the reactor in Figure 1.

In regards to instant claim 9, since it has been held to be obvious to one of ordinary skill in the art to apply a known technique to a known device (method, or product) ready for improvement to yield predictable results, it would have been obvious

to one of ordinary skill in the art at the time the invention was made to use one or more reactors for the purpose of producing more product. (*KSR*, 550 U.S. at ___, 82 USPQ2d at 1396; MPEP 2141 Examination Guidelines..., III. Rationales...)

In regards to instant claim 10, Hirsch discloses the use of a flat plate or gate slide valve at the bottom component of the reactor (col. 4, lines 1-3).

In regards to claim 13, Hirsch discloses the use of water flowing around the cooler tubes 12 (col. 4, lines 53-55). Ling discloses the use of a water jacket in col. 4, line 42.

In regards to instant claim 14, an apparatus for heating at least a region of a reactor is disclosed by Ling (col. 2, line 33), cooling a region of a reactor (col. 3, lines 58-60 of Hirsch; and col. 4, lines 30-32 of Ling), Ling discloses the feeding of silicon tetraiodide into a reactor in the presence of argon gas to produce hyper-pure silicon particles (col. 3, lines 6-23), Ling discloses a conical bottom (3 in Figure 1) and removing product silicon through a valve outlet (4 of Figure 1) in col. 2, lines 16-19. Ling discloses the removal of by-product gases in col. 2, lines 9-10.

In regards to instant claim 15, Ling discloses heating a reactor to produce high purity silicon using silicon tetraiodide in col. 2, line 45-46.

In regards to instant claim 16, Hirsch discloses the use of 100°F water for cooling in col. 8, line 55.

In regards to instant claim 17 and 19, Ling discloses the decomposition of several silicon compounds, including silane or monosilane between the temperatures of about 600°C to 1200°C (col. 5, line 64).

In regards to instant claim 18, Ling discloses a conical bottom (3 in Figure 1) and removing product silicon through a valve outlet (4 of Figure 1) in col. 2, lines 16-19.

In regards to instant claim 20, Ling disclose the use of an inert diluent gas such as hydrogen for silane in col. 5, line 29.

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 2,488,406 (Hirsch) and U.S. Patent 3,012,861 (Ling) as applied to claim 1 above, and further in view of U.S. Patent 5,421,843 (Teague et al.).

In regards to instant claims 11-12, Hirsch discloses a reactor apparatus (Figure 1 and col. 3, lines 55-75) having a pressure vessel (shell 10) with a conical bottom 11, a catalyst reactivator 19 and standpipe 18 (similar to a reaction tube), gas feed 20, and a cooling tubes 12 that are mounted in the walls of the device. Furthermore, Hirsch discloses the use of other separators, such as electrostatic precipitators, filters and the like (col. 5, lines 46-47).

Hirsch does not disclose a heat source, a collection cone, or a gas outlet unit having a gas inlet/guiding region, filtering system, and gas outlet. However, Ling discloses a silicon reactor apparatus (Figure 1 and col. 2, lines 1-19) having a heating means 11, a conical bottom 3 connected to a valve outlet 14, and an outlet unit comprised of outlet 9, cyclone 13, condensing system 10 for removing by-product gases. Hirsch and Ling are analogous art in that they both disclose the use of a reactor.

Neither Hirsch nor Ling expressly discloses the use of filter candles. However, Teague et al. recites the use of filter candles made from organic or inorganic fibers for filtering emissions-containing air in claims 1-4. Hirsch, Ling, and Teague et al. are analogous art in that they disclose the use of a reactor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the use of the Teague et al. filter candles with the modified Hirsch and Ling reactor apparatus for the purpose of removing emissions from a processing operation (Abstract of Teague et al.).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRYAN T. KILPATRICK whose telephone number is (571)270-5553. The examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Samuel P Siefke/
Primary Examiner, Art Unit 1797

BK
AU 1797